



# Operating Instructions

## Motor protection circuit-breaker

> 8523/8



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## 2 General Information

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### 2.1 Manufacturer

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Am Bahnhof 30  
74638 Waldenburg  
Germany

Tel: +49 7942 943-0  
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### 2.2 Operating Instructions Information

ID-No.: 146710 / 8523612300  
Publication Code: 2013-12-12·BA00·III·en·04

### 2.3 Conformity to Standards and Regulations

Conformity with standards and regulations is specified in the corresponding certificates and the Manufacturer's Declaration (EC Declaration of Conformity). These documents can be downloaded from our homepage [www.stahl-ex.com](http://www.stahl-ex.com).





### 3 Symbols Used

	<b>Safety Instructions</b> <b>Non-observance can result in damage to equipment, serious injuries or death.</b> The safety instructions contained in these operating instructions and affixed to the device must be observed!
	<b>Warning symbol</b> Danger due to explosive atmosphere!
	<b>Warning symbol</b> Danger due to live parts!
	<b>Note</b> This graphic marks important additional information, tips and recommendations.

### 4 General Safety Instructions

#### 4.1 Operating Instructions Storage



Read these operating instructions carefully and store them near the installation place. For correct operation, please observe all other documents enclosed in this delivery and the operating instructions of the equipment to be connected.

 <b>WARNING</b>	
	<b>Use the devices only for their intended purpose!</b> ► We cannot be held liable for damage caused by incorrect or unauthorized use or by non-observance of these operating instructions. ► Use the device only if it is undamaged.
 <b>WARNING</b>	
	<b>Any unauthorized work on the device is prohibited!</b> Installation, maintenance, overhaul and repair may only be carried out by appropriately authorized and trained personnel.

#### Observe the following information during installation and operation:

- Any damage can invalidate the explosion protection
- National and local safety regulations
- National and local accident prevention regulations
- National and local assembly and installation regulations
- Generally recognized technical regulations
- Safety instructions in these operating instructions
- Characteristic values and rated operating conditions on the rating plates and data plates
- Additional information plates fixed directly to the device

## 4.2 Alterations and Modifications

 <b>WARNING</b>	
	<b>Alterations and modifications to the device are not permitted!</b> We shall not accept any liability or warranty obligations for damage resulting from alterations and modifications.

## 4.3 Special Versions

In case of additional/different order options, special versions may differ from the description given here.

## 5 Intended Use

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The motor protection circuit breakers of Series 8523 are equipped with a non-adjustable fast short-circuit release and a thermal overcurrent release adjustable at the switch.

They are used for protecting and switching explosion-protected electric motors.

As "incomplete Ex equipment", they must be installed in a specially certified enclosure of type of protection "increased safety". The installation must be checked by a recognized expert.

They are certified for use in hazardous areas of Zones 1 and 2.

Special characteristics of the motor protection circuit breaker:

- X Phase failure sensitivity according to IEC/EN 60947
- X Temperature compensation within the ambient temperature range
- X Trip-free release
- X Isolating characteristics
- X Main switch and EMERGENCY-STOP characteristics in connection with the appropriate actuator
- X Can be fitted in any operating position

## 6 Technical Data

Version	8523/8			
Explosion protection				
Global (IECEEx)				
Gas and dust	IECEEx BVS 08.0039 U Ex de IIC Ex de I			
Europe (ATEX)				
Gas and dust	DMT 01 ATEX E 153 U ⊕ II 2 G Ex de IIC ⊕ I M 2 Ex de I			
Electrical data				
Rated operational voltage	max. 690 V AC, 50 / 60 Hz			
Minimal voltage	12 V AC			
Rated working current	0.1 ... 22.5 A dependent on adjustment range			
Switching capacity	dependent on adjustment range (AC)			
	230 V	400 V	500 V	690 V
	7.0 kW	12.4 kW	16.0 kW	22.0 kW
Thermal overcurrent trip	Adjustable at switch; dependent on adjustment range			
Electromagnetic fast trip	Adjustment range		Threshold values set at factory	
	0.16 A ... 0.63 A		7.5 ... 12.0 I <sub>n</sub>	
	1.0 A ... 2.5 A		9.0 ... 14.0 I <sub>n</sub>	
	4.0 A ... 6.3 A		10.0 ... 15.0 I <sub>n</sub>	
	9.0 A ... 22.5 A		12.5 ... 17.5 I <sub>n</sub>	
Short circuit protection			Fuse	
	U <sub>e</sub> (~V)	AC-3 (kW)	gG (A)	I <sub>K</sub> (A)
	220 / 230	7.0	20	≥ 300
	380 / 400	12.5	25	≥ 400
	500	16.0	35	≥ 650
	690	22.0		
Tripping class	10 A			

<b>Accessories</b>	
Auxiliary contacts	Options: none; 1 NC + 1 NO; 2 NC + 2 NO
Rated operational voltage $U_e$	max. 500 V AC
Rated operational current	AC 15: 24 V / 2.5 A    230 V / 2 A    400 V / 1 A DC 13: 24 V / 2.5 A    60 V / 2.5 A    110 V / 0.6 A    220 V / 0.25 A
Rated operational current at least	24 V DC: 5 mA 12 V DC: 10 mA
<b>Undervoltage trip</b>	
Function	When power is lost, circuit-breaker trips; this prevents unwanted restarting, e.g. of a motor
Pick-up voltage	$\geq 0.85 \times U_c$
Drop-out	$0.7 \dots 0.35 \times U_c$
Power input	
Inrush	0.9 VA
Holding	0.9 VA
<b>Shunt release</b>	
Function	For remote tripping of circuit-breakers by applying actuating voltage
Pick-up voltage	$\geq 0.85 \times U_c$
Power input	
Inrush	24 ... 60 V: 14.4 ... 90 VA; 110 ... 240 V: 13 ... 61 VA; 220 ... 415 V: 17.6 ... 62.3 VA
<b>Ambient conditions</b>	
Ambient temperature	-20 °C ... +40 °C
<b>Mechanical data</b>	
Enclosure material	Epoxy resin or polyester resin
Weight	8523/81: 1400 g 8523/82: 1800 g
Main contacts	3-pole
Mechanical life	$10^5$ operations
Impact strength to	IEC 6068-2-6
Sine wave impact	15 g (11 ms)
Connection	Main contacts    1.5 ... 6 mm <sup>2</sup> finely stranded 1.5 ... 10 mm <sup>2</sup> solid Auxiliary contacts 0.75 ... 1.5 mm <sup>2</sup> finely stranded 0.75 ... 2.5 mm <sup>2</sup> solid

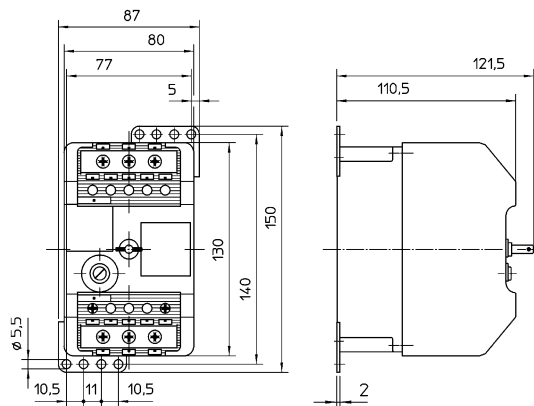
## 7 Transport and Storage

- Transport and storage are only permitted in the original packaging.
- The devices must be stored in a dry place and vibration-free.

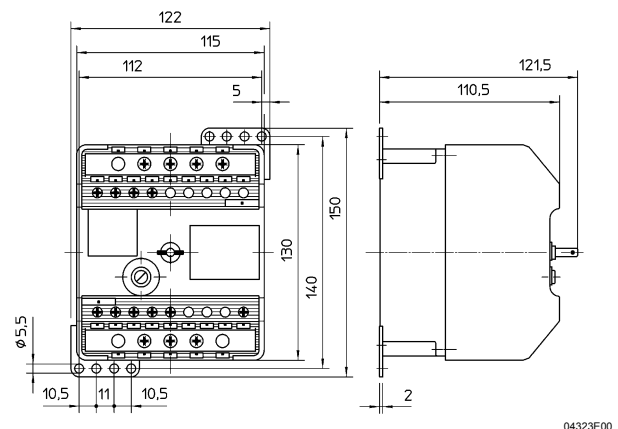
## 8 Installation

### 8.1 Dimensional Data / Fastening Dimensions

**Dimensional Drawings** (All Dimensions in mm ) - Subject to Alterations




8523/81  
Circuit-breaker for motor protection,  
Module width 1, without auxiliary contacts

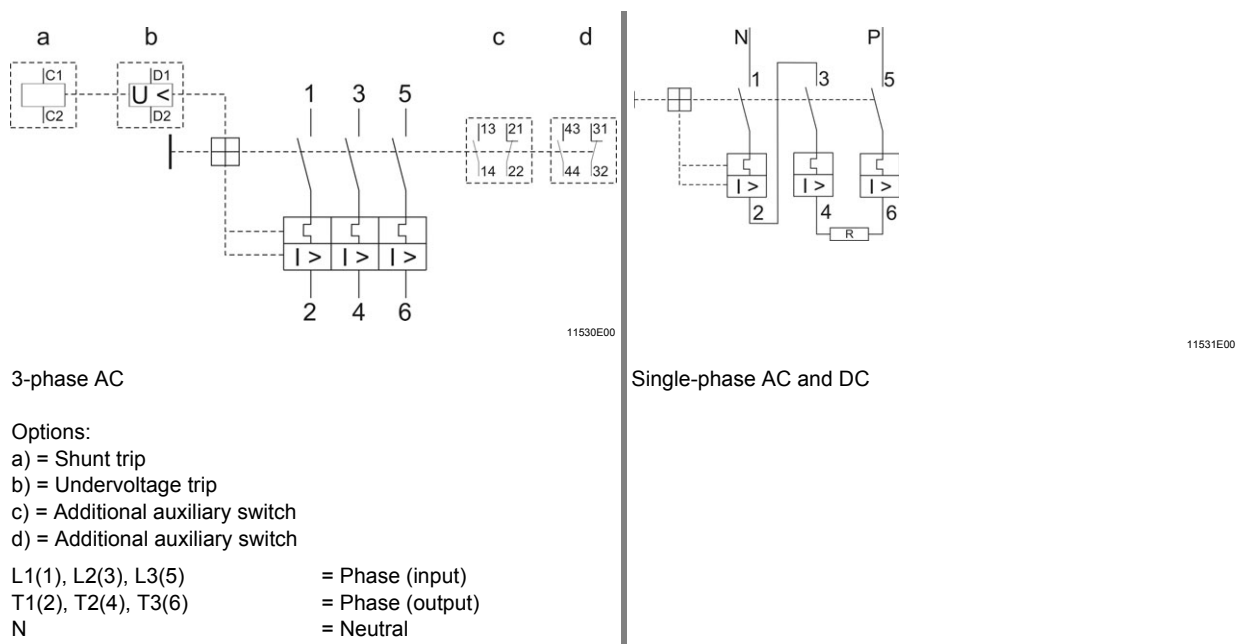


8523/82  
Circuit-breaker for motor protection,  
Module width 2, with auxiliary contacts

### 8.2 Installation Conditions for Electrical Connection

⚠ WARNING	
	<p><b>Incorrectly installed components!</b></p> <ul style="list-style-type: none"> <li>▶ If the components are installed incorrectly, explosion protection is no longer guaranteed.</li> <li>▶ Carry out installation strictly according to the instructions and national safety and accident prevention regulations (e.g. IEC/EN 60079-14).</li> </ul>
<ul style="list-style-type: none"> <li>▶ In case of a rated operational current of <math>\geq 15.5</math> A, a direct connection is <b>only</b> permitted with heat-resistant cables (resistant up to <math>&gt; 85</math> °C).</li> <li>▶ Be especially careful when connecting the cable.</li> <li>▶ The conductor insulation must reach to the terminal.</li> <li>▶ The conductor itself must not be damaged when removing the insulation.</li> <li>▶ Select the cables and the mode of running them in a way that the maximum permitted cable temperature is not exceeded.</li> </ul>	

Circuit-breaker connection diagram with connection references, options a), b), c) or d) and connections.



### 8.3 Installation Conditions for Electrical Connection Cross-Sections

**⚠ WARNING**

**Incorrectly installed components!**

- Explosion protection cannot be guaranteed any more if the components are incorrectly installed.
- When terminal sleeves are fitted, they must be gas-tight and applied with a suitable tool.

- 1 or 2 cables may be connected to a single terminal.
- If the conductors are single-wire, both must have the same cross-section and be of the same material.
- Cables can be connected without any special preparation.

	Main contact terminals	Auxiliary contact terminals
single-wire	 11532E00	 11533E00
	2 x 1.5 ... 10 mm <sup>2</sup> 2 x AWG 16 to 8	2 x 0.75 ... 1.5 mm <sup>2</sup> 2 x AWG 18 to 13
fine- or multi-stranded	 11534E00	 11535E00
	2 x 1.5 ... 6 mm <sup>2</sup> 2 x AWG 16 to 10	2 x 0.75 ... 1.5 mm <sup>2</sup> 2 x AWG 18 to 16
permitted torques	1.8 ... 2.0 Nm	1 ... 1.2 Nm

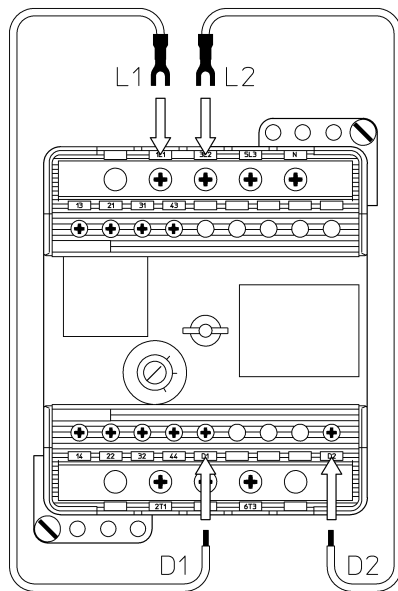


## 8.4 Back-up Fuses for Auxiliary Circuits

- ▶ As a general rule, auxiliary circuits must be protected by a 10 A gL fuse.

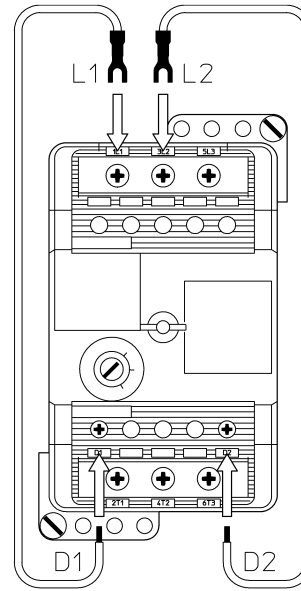
### Exception:

- ▶ An undervoltage trip is connected to the circuit-breaker main contact terminals.
- ▶ No back-up fuse is required.



Types  
8523/82

09140E00



Types  
8523/81

09029E00

## 9 Putting into Service

### ⚠ WARNING



#### Check the device before commissioning!

To ensure the correct operation, check the device before commissioning.

#### Before commissioning, ensure that:

- ▶ no components are damaged
- ▶ the device has been installed according to regulations
- ▶ there are no foreign bodies inside the device
- ▶ all screws and nuts have been firmly tightened
- ▶ the prescribed tightening torques have been observed
- ▶ connection has been made correctly

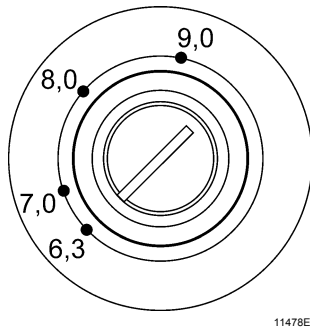
### 9.1 Setting the Thermal Overcurrent Trip

### ⚠ WARNING



#### Risk of explosion due to overheating of the motor!

- ▶ Risk of death or severe injuries!
- ▶ Set the thermal overcurrent release according to the technical data of the motor.



The required current value can be set by using a suitable screwdriver.  
The open end of the slot shows the set current value (see drawing for sample rated current of 6,3 A).

#### NOTE



If ambient temperatures differ from standard values, or between motor and circuit-breaker, the trip response must be checked – and the current setting changed if necessary.

## 10 Maintenance, Overhaul and Repair

#### ⚠ WARNING



#### **Risk due to unauthorized work being performed on the device!**

- ▶ Risk of injury and damage to equipment.
- ▶ Assembly, installation, commissioning, operation and maintenance must only be carried out by appropriately authorized and trained personnel.

#### ⚠ WARNING



#### **Danger due to live parts!**

- ▶ Risk of severe injuries.
- ▶ All connections and wiring must be disconnected from the power supply.
- ▶ Secure the connections against unauthorized switching.

#### ⚠ WARNING



#### **Short circuit in the circuit!**

- ▶ After multiple short circuits in the circuit, the flameproof enclosure is no longer guaranteed.
- ▶ After a short circuit in the circuit, check the functionality of the device.
- ▶ Replace the entire device, if necessary.

## 10.1 Regular Maintenance Work

- ▶ Consult the relevant national regulations (e.g. IEC/EN 60079-17) to determine the type and extent of inspections.
- ▶ Plan the intervals such that any expected defects in the equipment are detected promptly.

### To check as part of maintenance:

- ▶ Check if the cables are clamped properly.
- ▶ Inspect the device for signs of visible damage.
- ▶ Compliance with the permitted temperatures in accordance with IEC/EN 60079-0.
- ▶ Make sure that the device is used according to its designated use.
- ▶ Make sure the operating handle can be reset.



## 11 Cleaning

- ▶ Clean with a cloth, brush, vacuum cleaner or similar items.
- ▶ When cleaning with a damp cloth, use water or mild, non-abrasive, non-scratching cleaning agents.
- ▶ Never use aggressive cleaning agents or solvents.

## 12 Disposal

- ▶ Observe the national waste disposal regulations.

## 13 Accessories and Spare Parts

⚠ WARNING				
	<b>If wrong accessories are used, explosion protection cannot be guaranteed!</b>			
	Use only original R. STAHL accessories and spare parts.			
Designation	Illustration	Description	Art. no.	Weight kg
Jumper		for undervoltage release, length 400 mm	147121	0.019

## 14 Tripping Characteristics

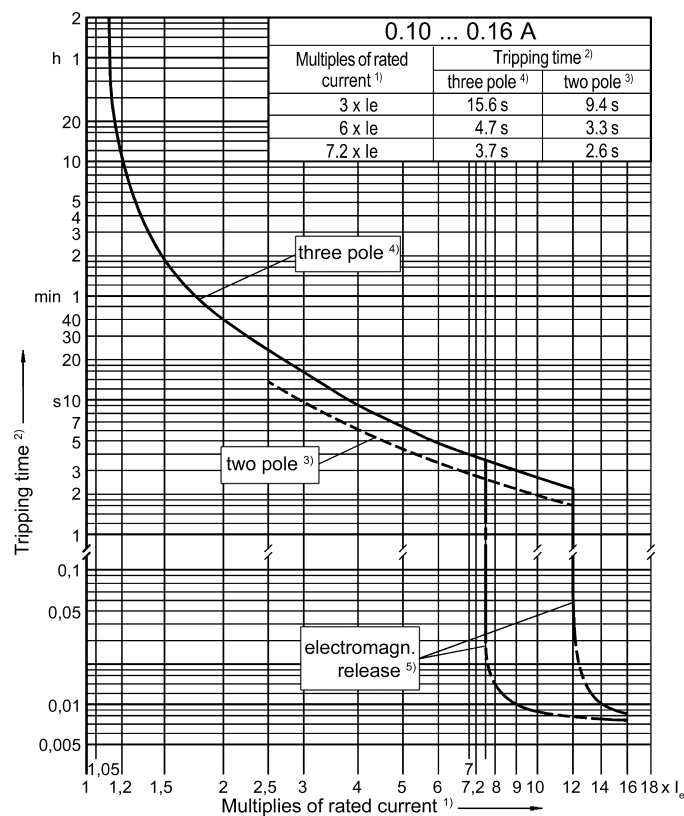
The tripping characteristic curves refer to a 3-pole load from cold state at an ambient temperature of +20 °C and any position.

The deviation of the tripping time (from a current three times higher than the rated current) is  $\pm 20\%$  maximum according to IEC/EN 60079-14.

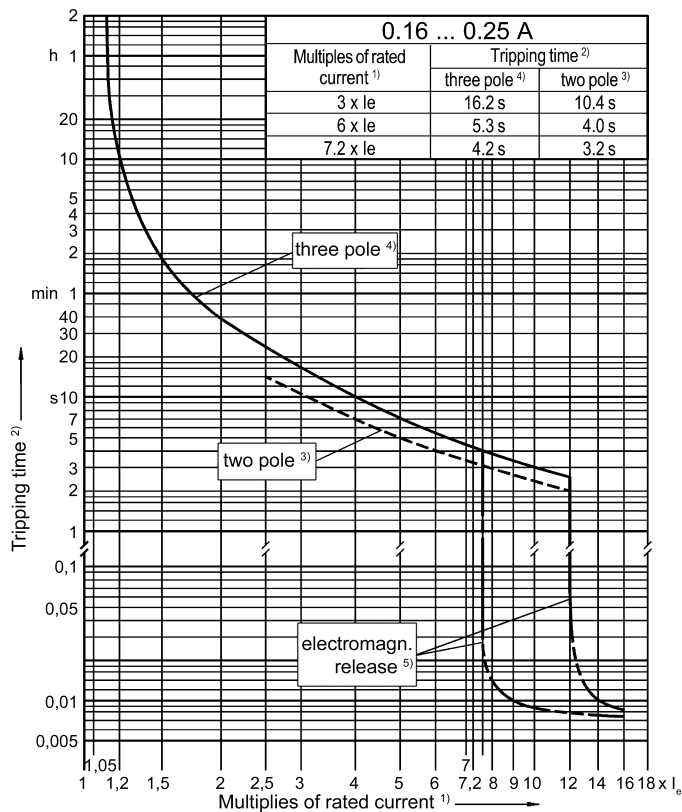
The following tripping characteristic curves show the tripping time as a function of the current ratio  $I_a/I_e$ .

Legend:

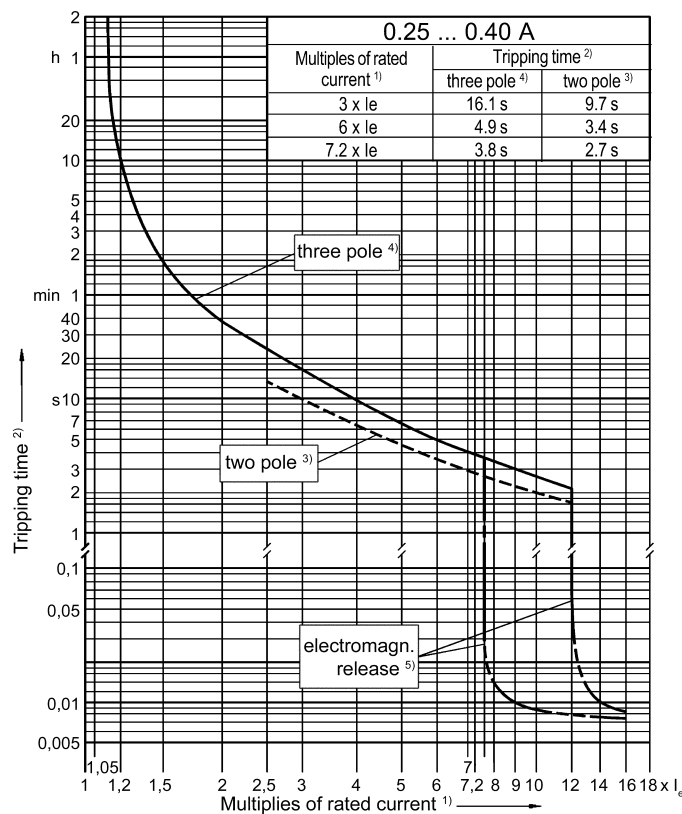
- 1) Multiples of the rated current
- 2) Tripping time
- 3) 2-pole
- 4) 3-pole
- 5) Electromagnetic tripping



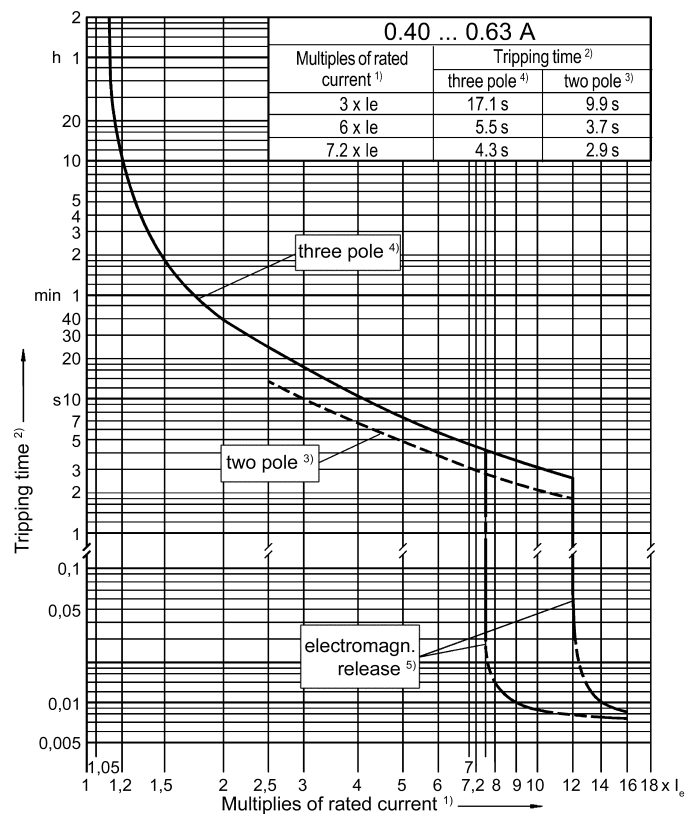
05930E00



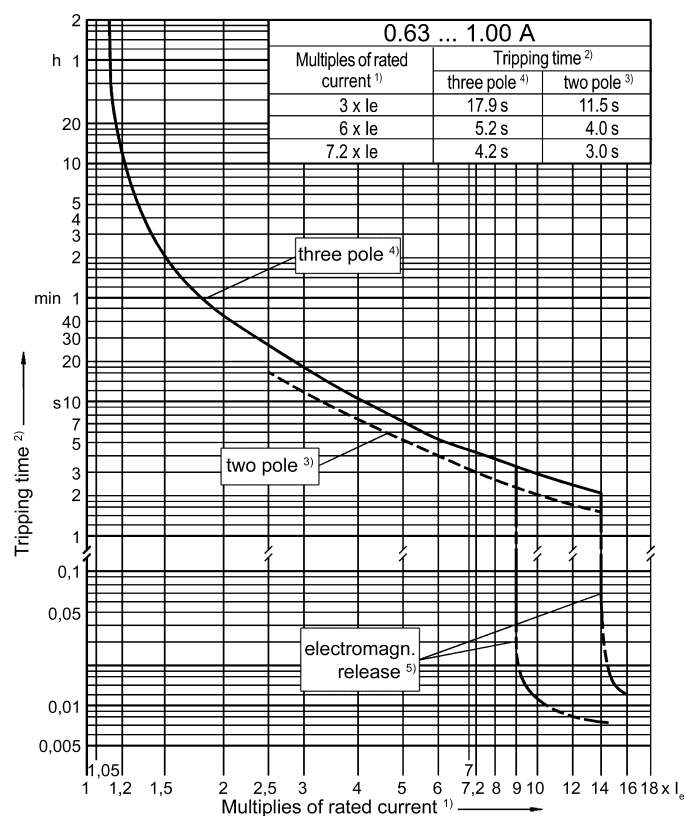
05931E00



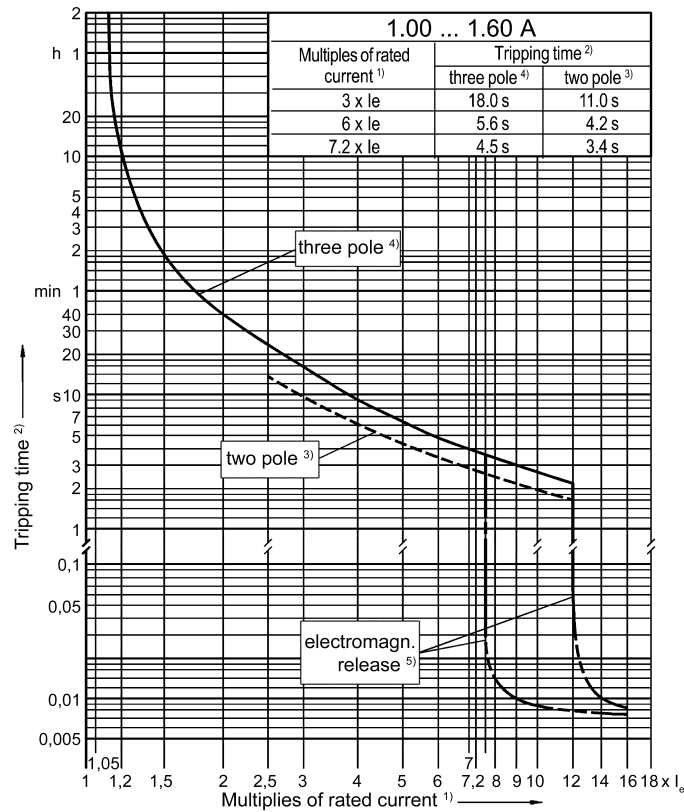
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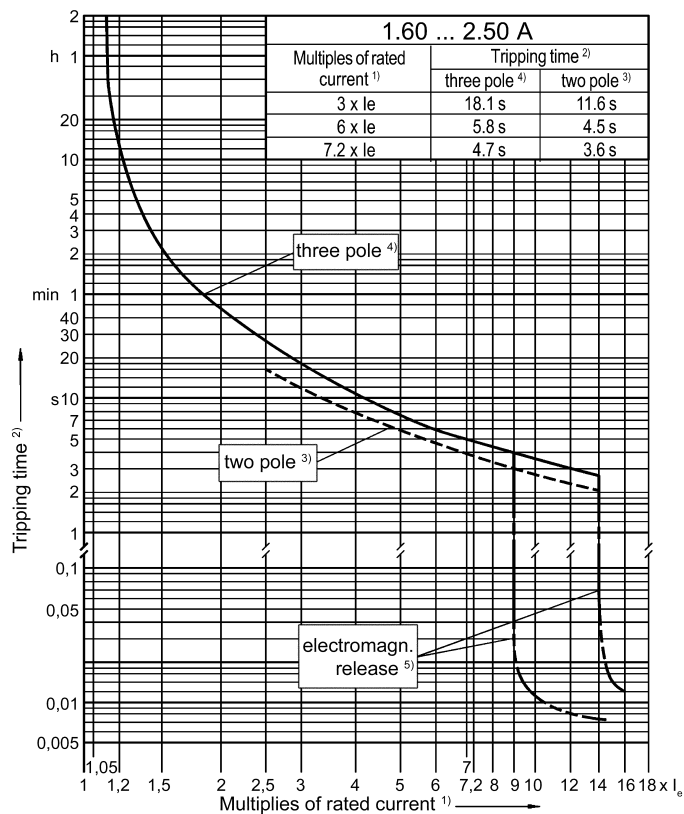
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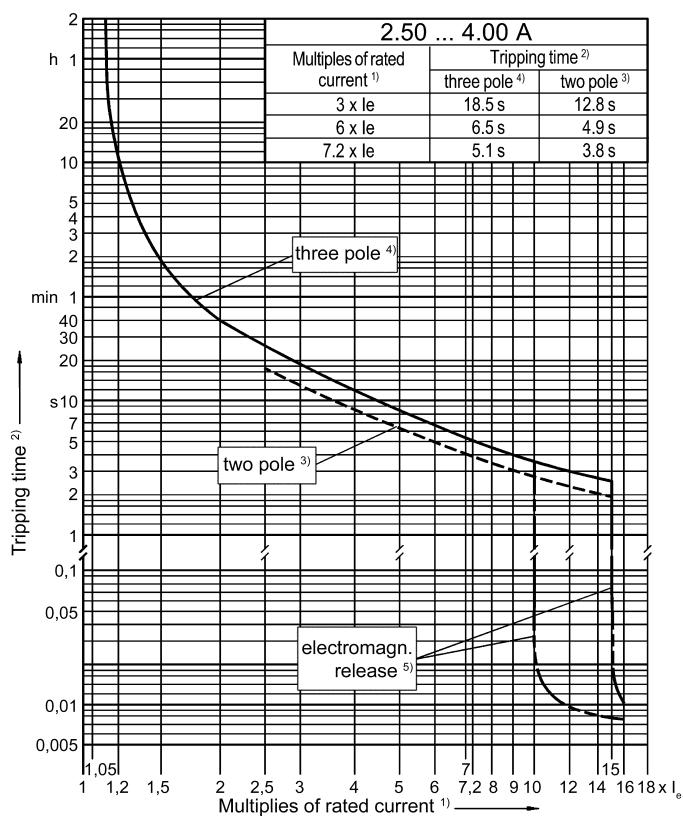
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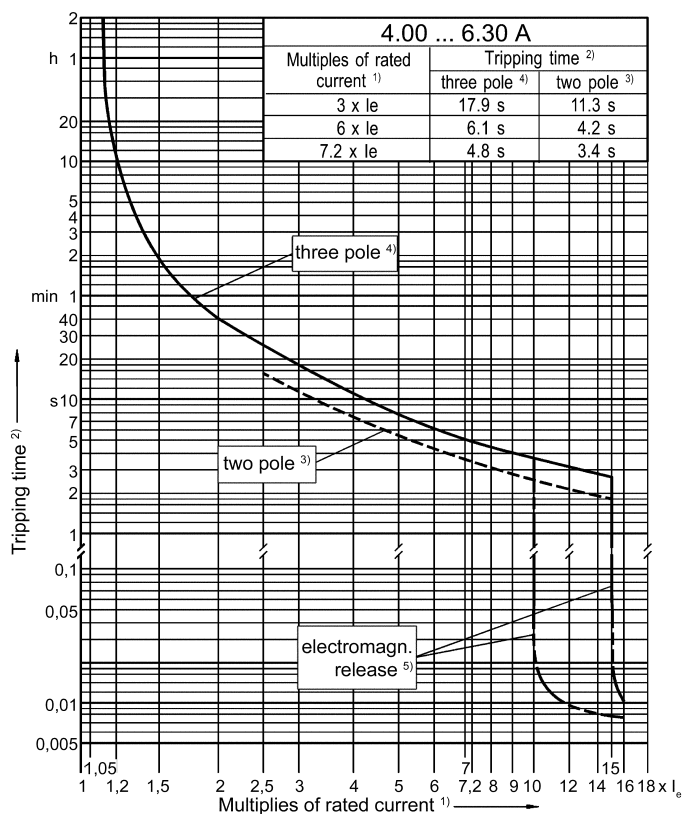
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05940E00

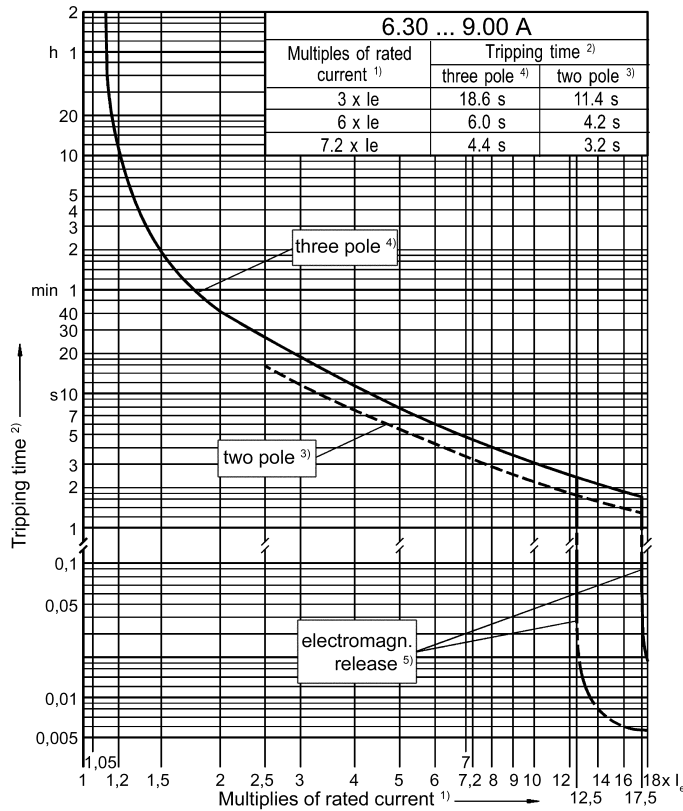


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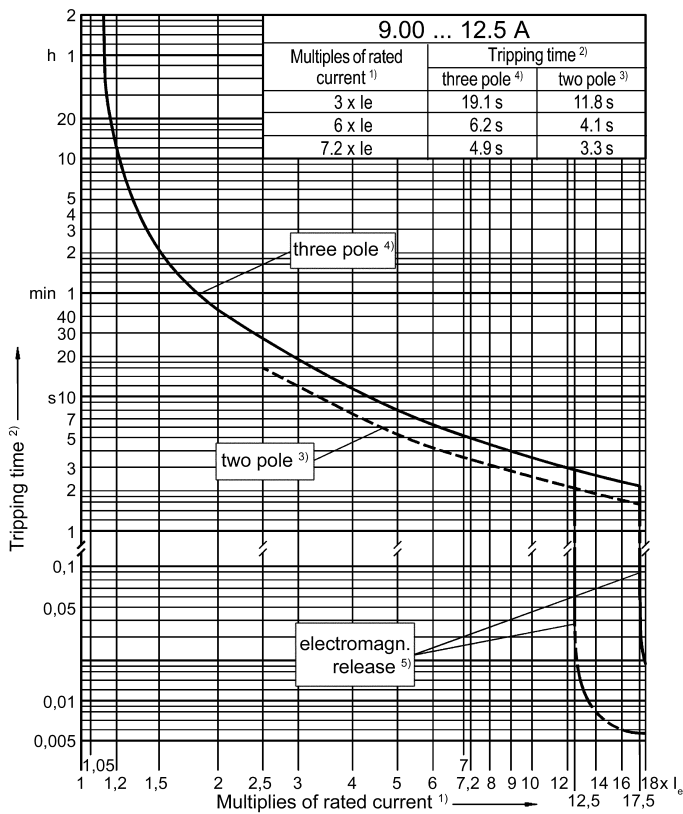


05942E00

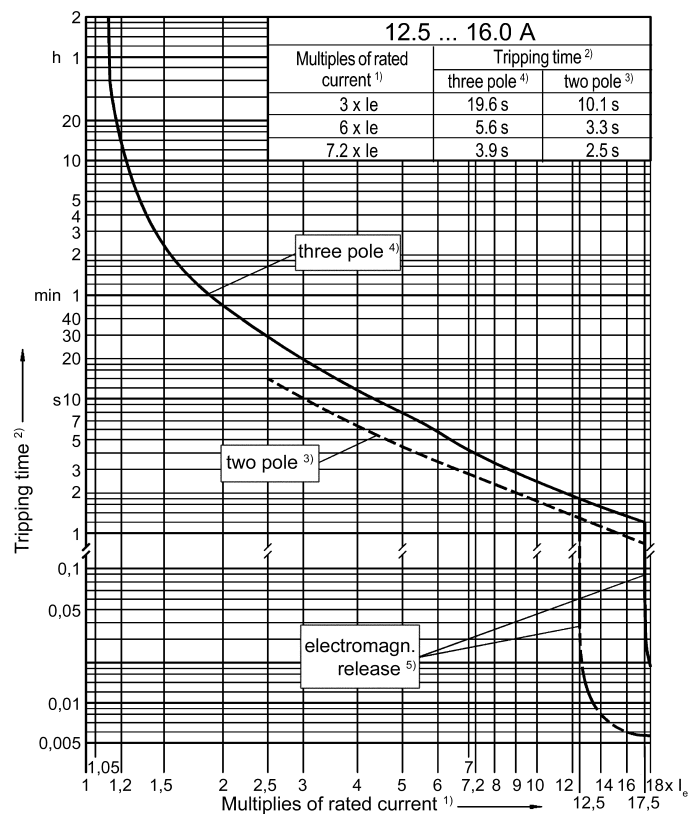




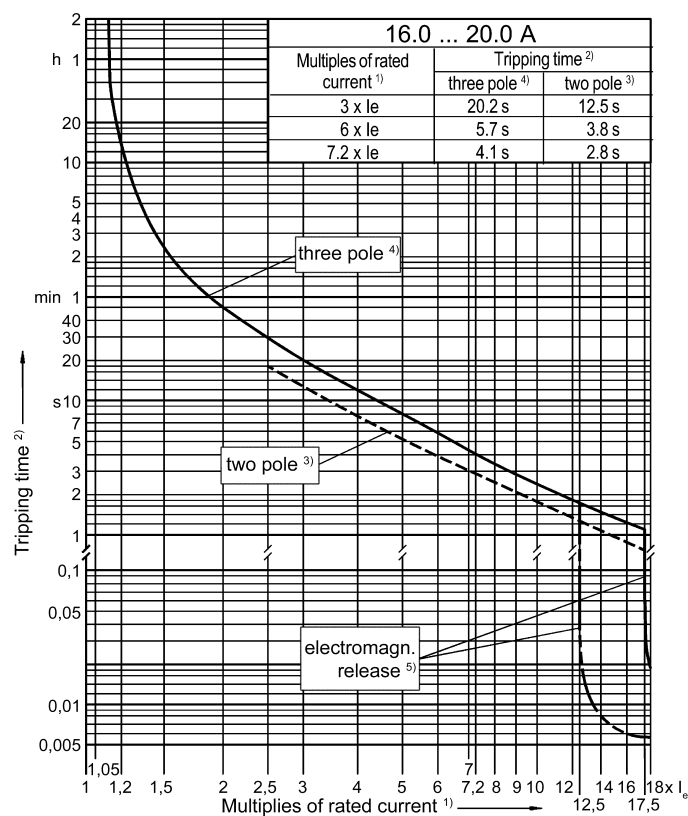
05943E00



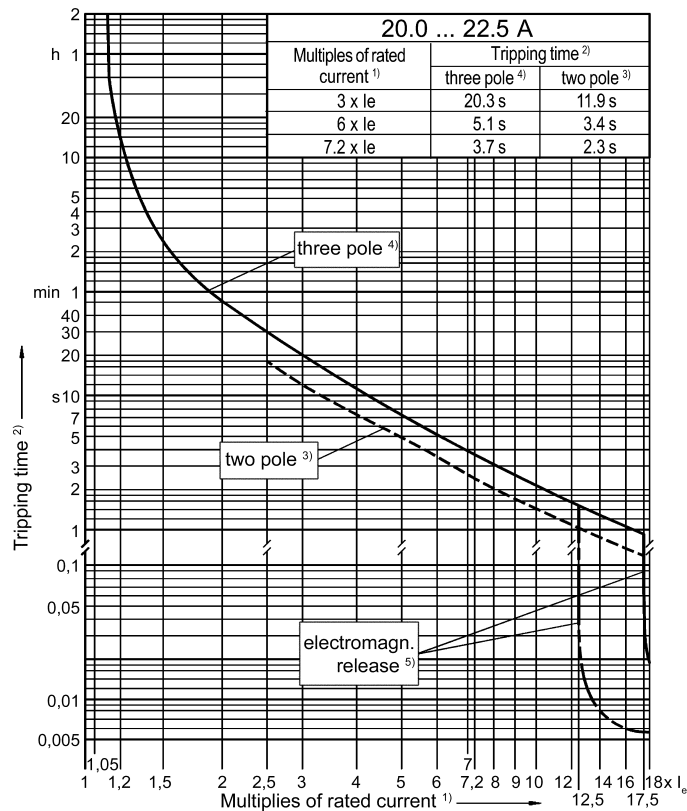
05944E00



05945E00



05946E00



05947E00

	<p>Circuit-breakers (motor protection switches) for squirrel cage motors must be so selected that the tripping time with 3-pole loading is not greater than the warm-up time <math>t_E</math> given on the machine test plate. (The tripping time should be taken from the <math>I_A/I_N</math> ratio curve of the machine to be protected.)</p>
	<p>The value for tripping time <math>t_A</math> relative to the ratio of operating currents <math>I_A/I_N</math> should not only guarantee safe switch-off within the warm-up time (<math>t_A \leq t_E</math>) but also still enable the motor to run up to speed safely when the trip is at operating temperature.</p>
	<p>IEC/EN 60079-7 specifies that the warm-up time <math>t_E</math> shall not be shorter than 5 seconds.</p>

**Konformitätserklärung**  
*Declaration of Conformity*  
*Déclaration de Conformité*



**R. STAHL Schaltgeräte GmbH • Am Bahnhof 30 • 74638 Waldenburg, Germany**  
 erklärt in alleiniger Verantwortung, declares in its sole responsibility, déclare sous sa seule responsabilité,


dass das Produkt:  
 that the product:  
 que le produit:

**Motorschutzscharter**  
*Motor protection circuit-breaker*  
*Disjoncteurs moteurs*

**Typ(en), type(s), type(s):**

**8523/8\*-\*\*\*\*\***

mit den Anforderungen der folgenden Richtlinien und Normen übereinstimmt.  
 is in conformity with the requirements of the following directives and standards.  
 est conforme aux exigences des directives et des normes suivantes.

Richtlinie(n) Directive(s) Directive(s)	Norm(en) Standard(s) Norme(s)
94/9/EG: ATEX-Richtlinie 94/9/EC: ATEX Directive 94/9/CE: Directive ATEX	EN 60079-0:2012 EN 60079-1:2007 EN 60079-7:2007
Kennzeichnung, marking, marquage:	<div>  II 2 G Ex d e IIC Gb                      I M2 Ex d e I Mb                 </div> <div>NB0158</div>
EG-Baumusterprüfbescheinigung: EC Type Examination Certificate: Attestation d'examen CE de type:	DMT 01 ATEX E 153 U (DEKRA EXAM GmbH, Dinnendahlstraße 9, 44809 Bochum, Germany, NB0158)
Produktnormen nach Niederspannungsrichtlinie: Product standards according to Low Voltage Directive: Normes des produit pour la Directive Basse Tension:	EN 60947-1:2007+A1:2011 EN 60947-2:2006 + A1:2009+A2:2013 EN 60947-4-1:2010+A1:2012
2004/108/EG: EMV-Richtlinie 2004/108/EC: EMC Directive 2004/108/CE: Directive CEM	Nicht zutreffend nach Artikel 1, Absatz 3. Not applicable according to article 1, paragraph 3. Non applicable selon l'article 1, paragraphe 3.

Spezifische Merkmale und Bedingungen für den Einbau siehe Betriebsanleitung.  
 Specific characteristics and how to incorporate see operating instructions.  
 Caractéristiques et conditions spécifiques pour l'installation voir le mode d'emploi.

Waldenburg, 2014-07-21

Ort und Datum  
 Place and date  
 Lieu et date

i.V.

Steffen Buhl  
 Leiter Entwicklung Schaltgeräte  
 Director R&D Switchgear  
 Directeur R&D Appareillage

i.V.

J.-P. Rückgauer  
 Leiter Qualitätsmanagement  
 Director Quality Management  
 Directeur Assurance de Qualité